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September 28, 2018

Arthur Burbank
USDA Forest Service
4350 South Cliffs Dr.
Pocatello, ID 83204

**Subject: Biological Selenium Removal Treatment Technology
Water Treatment Pilot Study
August 2018 Progress Report**

Dear Art,

This progress report summarizes key activities in August 2018 associated with Phase 2 of the Water Treatment Pilot Study located near Hoopes Spring. This Pilot Study is being conducted as part of the Smoky Canyon Mine Remedial Investigation/Feasibility Study (RI/FS) to provide information on the effectiveness of the active biological treatment system in removing selenium and other COPCs from South Fork Sage Creek Springs and Hoopes Spring.

Work related to the approved Phase 2 Pilot Study continues at the site in accordance with the Final *Phase 2 Pilot Study Work Plan and Sampling and Analysis Plan, Ultra-Filtration/Reverse Osmosis and Biological Selenium Removal Fluidized Bed Bioreactor Treatment Technology* (Phase 2 WP/SAP).

Identification of Deliverables and Data Transmittals

There were no outstanding deliverables or transmittals for the month of August. At the time of this report, laboratory data for the Week 22 through Week 28 sampling has been received. Preliminary laboratory data are presented in Table 1. The field data for the Week 22 through Week 28 sampling event is summarized in Table 2.

Completed Activities

The following activities associated with the Phase 2 Pilot Study were completed in August 2018:

- Continued system operation and treatment of selenium.

The Treatment System Pilot (TSP) influent concentration for Week 22 through Week 28 ranged from 143 ug/L to 154 ug/L. The Treatment System Pilot effluent concentration for Week 22 through Week 28 ranged from 15.5 ug/L to 21.9 ug/L. The removal efficiency ranged from 85% to 89% for total selenium removal.

The average flow of the TSP was 1,710gpm for August. Since full scale operations began in early December 2017 approximately 665 million gallons of impacted water has been treated. The mass of selenium removed from December 2017 through August 2018 is approximately 680 pounds.





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Upcoming Activities

The following activities associated with the Phase 2 Pilot Study are planned through September 2018:

- Continue system monitoring in accordance with the sampling and analysis plan.

Please contact me if there are questions regarding this monthly progress report.

Sincerely,

Jeffrey Hamilton
Environmental Engineer

cc:

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Table 1
Laboratory Results Focused Analyte List

Hoopes Springs Water Treatment Plant Pilot Study
Phase 2, Performance Monitoring

Analyte >>			General Chemistry			Nutrients			Metals and Metalloids	
			Ammonia, as N	Biochemical Oxygen Demand	TSS	Nitrate, as N	Phosphorus, Total	Sulfide	Selenium, Dissolved	Selenium, Total
Units >>			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Station	Sample ID	Date								
Week 22										
Influent	SC0718-LSSHS-IN002	7/18/2018	0.026 U	2 U	2 U	0.29	0.0298	1 U	0.154	0.154
Ultra Filtration Backwash	SC0718-LSSHS-UFB002	7/18/2018	0.026 U	2 U	2 U	0.11	0.0209	1 U	0.026	0.0255
Effluent	SC0718-LSSHS-EF002	7/18/2018	0.026 U	2 U	2 J	0.41	0.236	1 U	0.0172	0.0172
Week 24										
Influent	SC0818-LSSHS-IN001	7/30/2018	0.026 U	2 U	2 U	0.29	0.0203	1 U	0.143	0.137
Ultra Filtration Backwash	SC0818-LSSHS-UFB001	7/30/2018	0.026 U	2 U	2 J	0.74	0.266	1 U	0.0192	0.018
Effluent	SC0818-LSSHS-EF001	7/30/2018	0.026 U	2 U	2 U	0.11	0.0365	1 U	0.0155	0.0148
Week 26										
Influent	SC0818-LSSHS-IN002	8/15/2018	0.026 U	2 U	2 U	0.3	0.028	1 U	0.15	0.149
Ultra Filtration Backwash	SC0818-LSSHS-UFB002	8/15/2018	0.026 U	2 U	2 U	0.12	0.0306	1 U	0.0212	0.021
Effluent	SC0818-LSSHS-EF002	8/15/2018	0.026 U	2 U	2 U	0.21	0.392	1 U	0.0219	0.0218
Week 28										
Influent	SC0818-LSSHS-IN003	8/29/2018	0.026 U	2 U	2 U	0.67	0.0261	1 U	0.149	0.149
Ultra Filtration Backwash	SC0818-LSSHS-UFB003	8/29/2018	0.026 U	2 U	2 U	0.11	0.0388	1 U	0.017	0.0166
Effluent	SC0818-LSSHS-EF003	8/29/2018	0.026 U	2 U	2 J	0.52	0.203	1 U	0.0208	0.0203

Notes:

Results presented are preliminary, and have not been validated at the time of this report.

U - Analyte not detected above the method detection limit (MDL).

J - Result is estimated.

Table 2 Field Water Quality Data

Hoopes Springs Water Treatment Plant Pilot Study
Phase 2, Performance Monitoring

		Parameter >>	Dissolved Oxygen	ORP	pH	SC	Temperature	Turbidity
		Units >>	mg/L	mV	SU	umhos/cm	C	NTU
Station	Sample ID	Date						
Week 22								
Influent	SC0718-LSSHS-IN002	7/18/2018	10.27	167	7.55	441	14.23	0
Ultra Filtration Backwash	SC0718-LSSHS-UFB002	7/18/2018	9.07	148	7.42	110	13.16	0
Effluent	SC0718-LSSHS-EF002	7/18/2018	5.77	153	7.58	423	13.51	0
Week 24								
Influent	SC0818-LSSHS-IN001	7/30/2018	10.32	158	7.74	4444	13.94	0
Ultra Filtration Backwash	SC0818-LSSHS-UFB001	7/30/2018	9.16	155	7.48	69	13.41	0
Effluent	SC0818-LSSHS-EF001	7/30/2018	8.47	148	7.66	458	13.48	0
Week 26								
Influent	SC0818-LSSHS-IN002	8/15/2018	12.67	124	7.79	436	15.25	0
Ultra Filtration Backwash	SC0818-LSSHS-UFB002	8/15/2018	7.76	138	7.12	88	13.55	0
Effluent	SC0818-LSSHS-EF002	8/15/2018	10.77	124	7.61	478	13.35	0
Week 28								
Influent	SC0818-LSSHS-IN003	8/29/2018	7.6	112	7.24	435	14.84	0
Ultra Filtration Backwash	SC0818-LSSHS-UFB003	8/29/2018	10.83	106	6.97	88	13.42	0
Effluent	SC0818-LSSHS-EF003	8/29/2018	10.33	89	7.59	453	13.23	0